Lake Erie
Fisheries Assessment Unit
Report 1988-3

Summer Creel Census at Long Point, Lake Erie, 1987

Les Sztramko
Ontario Ministry of Natural Resources
Lake Erie Fisheries Assessment Unit
R.R. #2, Wheatley, Ontario N0P 2P0

Additional copies of this publication
are available from the address above

©1988 Government of Ontario

Ontario
Ministry of
Natural
Resources
Lyn McLeod
Minister

TABLE OF CONTENTS

	PAGE
ABSTRACT	iii
INTRODUCTION	1
DESCRIPTION OF THE STUDY AREA	1
METHODS	
CREW AND EQUIPMENT	3
SCHEDULE	3
PROCEDURES	3
DATA ANALYSIS	5
RESULTS AND DISCUSSION	
DISTRIBUTION OF ANGLING EFFORT	6
CATCH AND HARVEST	8
CATCH PER UNIT OF EFFORT	8
AGE COMPOSITION OF THE COHO SALMON HARVEST	8
ANGLER CHAPACTERISTICS	8
ACKNOWLEDGEMENTS	9
REFERENCES	9
APPENDICES	14

ABSTRACT

A stratified roving on-water creel survey was conducted in the Long Point tip area of Lake Erie during July and early August, 1987. The survey crew conducted 269 interviews involving 710 angler contacts.

Anglers expended an estimated 11,275 ± 3,842 (95% C.I.) rod-hours of fishing effort and harvested 601 ± 372 coho salmon (Oncorhynchus kisutch), 17 chinook salmon (Oncorhynchus tshawytscha), 31 rainbow trout (Salmo gairdneri), 4 lake trout (Salvelinus namaycush) and 33 walleye (Stizostedion vitreum vitreum). Ninety-three percent of anglers indicated that they were seeking coho salmon.

Angling success rates, or the numbers of fish caught per rod-hour included the following: 0.059 (coho salmon), 0.002 (chinook salmon), 0.003 (rainbow trout), and 0.003 (walleye).

Angler characteristics were as follows. Residents of Ontario constituted 99% of all anglers with 60% of the total coming from the Regional Municipality of Haldimand Norfolk. Ninety-nine percent of all anglers fished from boats using downriggers.

INTRODUCTION

A roving on-water creel survey was conducted in the Canadian waters adjacent to the tip of Long Point, Lake Erie from July 1 to August 8, 1987.

The objectives of this survey were to:

1. quantify the angling catch and harvest;
2. estimate the angling effort and success;
3. determine the age and length composition of the harvest;
4. to describe angler characteristics including the following: origin, use of commercial lodging and professional fishing guides, and type of fishing.

DESCRIPTION OF THE STUDY AREA

The study area was restricted to the Canadian waters adjacent to the tip of Long Point in Lake Erie's Eastern Basin (Figure 1). It comprised 704 square kilometres and was defined by the following boundaries:

North - latitude 42^{o} 41' 12"

East - latitude 79^{o} 50' 00"

South East - International Border (62^{o} - True North)

South - latitude 42^{o} 24' 24"

West - longitude 80^{o} 10' 00"

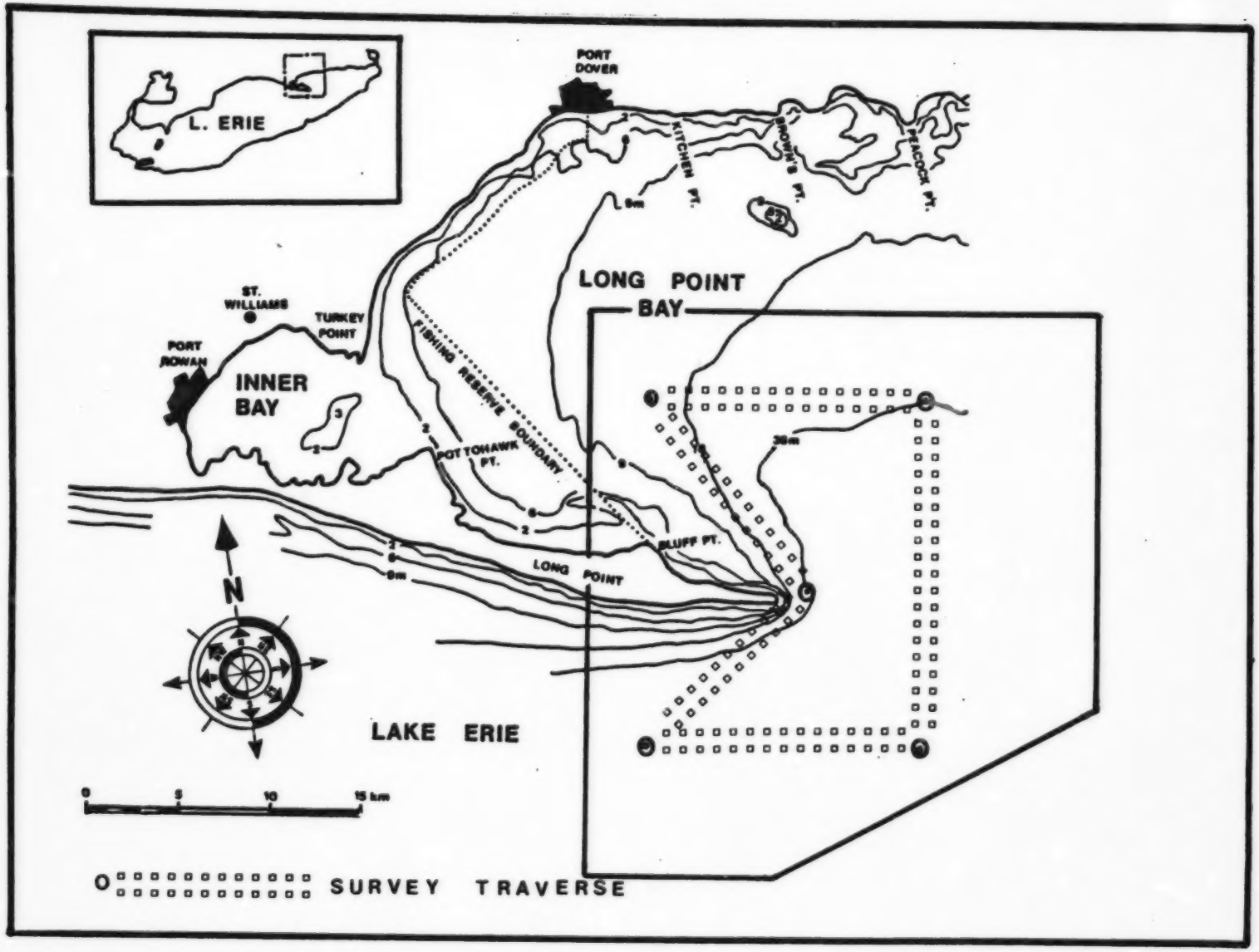


Figure 1. The study area including the survey traverse.

METHODS

Crew and Equipment

The crew consisted of an owner-operator of a chartered boat and a census clerk. They used a 25-foot fibreglass, modified deep-V hull boat powered by a V-8 engine.

Sampling equipment included a metric measuring board, thermometer, forceps, knife and water tight containers which held the following: maps, field forms (Appendix A), scale envelopes, fish identification guide and Ontario Fishing Regulation pamphlets.

Schedule

Survey days were chosen systematically and independently for each of weekdays and weekend days during the July 1 to August 8 period. Every third weekday and every second Saturday and Sunday were sampled (Table 1).

On each scheduled day, either a morning (0800-1300 h) or afternoon (1300-1800 h) five-hour period was systematically selected for sampling. This resulted in sampling intensities of 16% and 23% of the total potential weekday and weekend-day fishing times respectively.

Overall sampling intensity was 18% of the total potential fishing time.

Procedures

Boat counts were made to determine the mean number of boats present in specific strata. A flip of a coin at the starting point determined whether the survey boat would proceed in a clockwise or counter-clockwise traverse through the study area (Figure 1):

Clockwise Traverse

Starting Point:	Latitude 42^{o} 38' 36" Longitutde 80^{o} 7' 24"
Clockwise Bearing:	98.5^{o} (magnetic); 15.0 km
Turning Point:	Latitude 42^{o} 38' 36" Longitutde 79^{o} 56' 36"
Clockwise Bearing:	188.5^{o} (magnetic); 19.0 km

Turning Point: Latitude 42° 28' 12"
Longitutde 79° 56' 36"

Clockwise Bearing: 278.5° (magnetic); 15.0 km

Turning Point: Latitude 42° 28' 12"
Longitutde 80° 7' 24"

Clockwise Bearing: 54° (magnetic); 12.5 km

Turning Point: Latitude 42° 32' 48"
Longitutde 80° 1' 00"

Clockwise Bearing: 328° (magnetic); 13.5 km

Counter-clockwise Traverse

Starting Point: Latitude 42° 38' 36"
Longitutde 80° 7' 24"

Counterclockwise Bearing: 148° (magnetic); 13.5 km

Turning Point: Latitude 42° 32' 48"
Longitutde 80° 1' 00"

Counterclockwise Bearing: 234° (magnetic); 12.5 km

Turning Point: Latitude 42° 28' 12"
Longitutde 80° 7' 24"

Counterclockwise Bearing: 98.5° (magnetic); 15.0 km

Turning Point: Latitude 42° 28' 12"
Longitutde 79° 56' 36"

Counterclockwise Bearing: 8.5° (magnetic); 19.0 km

Turning Point: Latitude 42° 38' 36"
Longitutde 79° 56' 36"

Counterclockwise Bearing: 278° (magnetic); 15.0 km

Prior knowledge indicated that angling locations varied with time and boats were usually located in discrete clusters. In this regard, survey crews proceeded through the study area and conducted instantaneous or progressive (depending upon visibility conditions) boat counts of each cluster. After the number of boats in each cluster was determined, some boats were selected and their occupants interviewed. Interview information was recorded on Creel Interview Forms (Appendix A) along with interview-specific location (latitude/longitude) data in degrees, minutes and hundredths of minutes. These data were obtained from a Loran-C navigational device on the survey boat. Once all clusters were sampled, the count/interview process was repeated as time allowed.

Only boats with fishing lines in the water were included in the boat counts. The cumulative total was maintained on a mechanical hand counter until all clusters were sampled and this figure was recorded on the Creel Log Form (Appendix A). If time permitted multiple cycles of boat counts/interviews, then replicate counts were included on the same Creel Log Form.

Although the harvest was originally intended to be sampled for scale samples and biolgical data, the rough water conditions precluded doing so. As a second order approximation, samples of coho salmon and rainbow trout were obtained from the Turkey Point Fishing Derby on July 18 and July 19.

Data Analysis

Data were analyzed using standardized provincial creel census analysis software --CREESYS-- Version 3.3 (Lester and Trippel 1985). CREESYS formulae after Petzold (1980) employed to produce estimates of catch, effort and angler success rates are provided in Appendix B. Computer summaries are presented in Appendix C.

RESULTS AND DISCUSSION

During the July 1 - August 8 period, 269 interviews involving 710 angler contacts were conducted. In addition, 23 activity counts of fishing boats were undertaken.

Distribution of Angling Effort

Anglers expended an estimated 11,275 ± 3,842 (95% C.I.) rod-hours of fishing effort (Table 2). An estimated 4,199 rod-hours were expended by weekday anglers and 7,077 rod-hours by weekend day anglers. Mean angling effort was distributed almost evenly between morning and afternoon time periods. However, almost 4 times as much effort was expended on weekend-days as weekdays (Table 3).

It appears that the effort expended by anglers in 1987 was at a reduced level. In 1987, mean instantaneous boat counts of 7 and 23 boats on weekdays and weekend days respectively (Appendix C) represented approximately 10% of the boats counted by MNR personnel on several occasions in 1985 (pers. comm. D.Miller). Reduced angling success rates for salmonids probably deterred anglers from fishing this area in 1987:

	Angling Success (no. of fish caught per rod-hour)			
	Coho	Chinook	Rainbow trout	Walleye
1985	0.255	0.018	0.027	0.000
1986	0.358	0.005	0.023	0.002
1987	0.059	0.002	0.003	0.003

Although angling success rates for 1985 and 1986 are derived from volunteer angler diaries and are not directly comparable with results from the 1987 direct contact creel survey, they would be expected to agree reasonably closely as the fishery for salmon involves a segment of the angling population which takes its sport quite seriously, employing expensive and specialized equipment and relying on timely radio communications to locate fish.

Anglers fished an area of approximately 100 square kilometres generally located north-east of the Long Point tip (Figure 2). The heaviest concentrations of boats occurred between the two submerged gas wells located 2 (latitude 42° 33' 48", longitude 80° 1' 36") and 5 (latitude 42° 35' 00", longitude 80° 0' 12") kilometres from the Long Point tip at a compass bearing of 50° (magnetic).

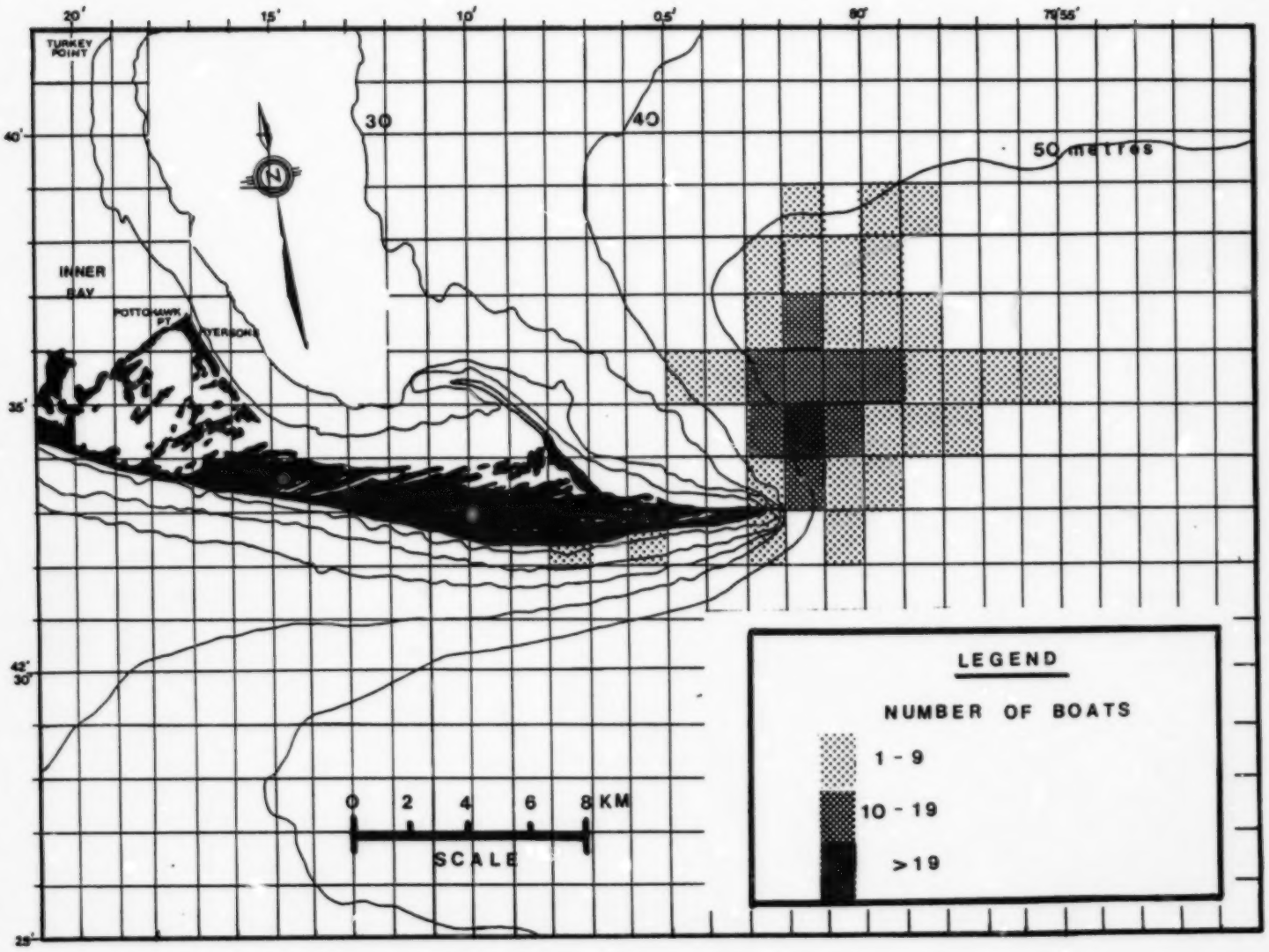


Figure 2. Relative densities of angling boats at the tip of Long Point, Lake Erie, July 1 to August 8, 1987.

Catch and Harvest

An estimated 1,395 fish were caught of which 692 (50%) were harvested (Table 4). The percent catch by numbers was comprised of the following species: freshwater drum (48%), coho salmon (43%), rainbow trout (2%) and walleye (2%).

Coho salmon (87%), walleye (5%), rainbow trout (4%) and chinook salmon (3%) constituted the majority of the harvest in numbers.

Percentages of anglers seeking a particular species (species angler) were: coho salmon (93%), rainbow trout (4%), chinook salmon (2%) and walleye (1%) (Table 5).

Catch Per Unit of Effort

Angling success rates for the various target species are presented in Table 6.

Age Composition of the Coho Salmon Harvest

Of the ten coho salmon sampled at the Turkey Point Derby, all were 2+ years old and had a mean weight of 3,515 g and a mean length of 649 mm.

Angler Characteristics

Of the 710 anglers who were contacted during the survey, 99% were residents of Ontario (60% of the total from the Regional Municipality of Haldimand-Norfolk), and 1% were U.S. citizens. All of the anglers travelled to the area for the day and none utilized commercial lodgings or provincial or commercial campgrounds. Ninety-nine percent of the anglers did not use professional fishing guides and 99% of the anglers fished from boats using downriggers.

ACKNOWLEDGEMENTS

I would like to thank Cathy Bassindale for collecting the data, and Ben VanPaemel for ably piloting the survey boat. In addition, Cathy Bassindale verified the field forms, and entered, edited and analyzed the data using CREESYS software. Debbie Schroeder typed the manuscript and Jerry Paine reviewed it.

Lastly, I am grateful to Tom Millar for kindly allowing me to sample fish at the Turkey Point Fish Derby and to John Piggott and Henry Kniss for providing helpful suggestions during the planning phase of the project.

REFERENCES

Lester, N.P. and E.A. Trippel. 1985. CREESYS User Manual. Systems Services Branch, Ontario Ministry of Natural Resources. Toronto, Ontario.

Petzold, M. 1980. APL programs for creel survey data. Lake Erie Fisheries Assessment Unit Report 1980-4. Ontario Ministry of Natural Resources, London, Ontario. 49pp.

Sztramko, L. 1986. Lake Erie Angler Diary Programme, 1985. Lake Erie Fisheries Assessment Unit Report 1986-4. Wheatley, Ontario.

Table 1. Creel census schedule in the Long Point Tip area of Lake Erie, 1987.

Date	Time Period[a]
July 3	AM
July 4	AM
July 7	PM
July 10	AM
July 12	AM
July 15	PM
July 18	PM
July 20	AM
July 23	PM
July 26	PM
July 28	AM
July 31	PM
August 1	AM
August 5	AM

[a] AM represents 0800 -1300 h
PM represents 1300 - 1800 h

Table 2. Distribution of angling effort by day-type and time-period in the Long Point tip area of Lake Erie, July 1 - August 8, 1987.

Time Period	Day-type		
	Weekday (rod-hours)	Weekend-day (rod-hours)	Total (rod-hours)
0800 - 1300 h	2,319	3,407	5,726
1300 - 1800 h	1,880	3,669	5,549
Total	4,199	7,077	11,275

Table 3. Distribution of mean angling effort by day-type and time-period in the Long Point tip area of Lake Erie, July 1 - August 8, 1987.

Time Period	Day-type		
	Weekday (rod-hours)	Weekend-day (rod-hours)	All Day-types (rod-hours)
0800 - 1300 h	86	284	147
1300 - 1800 h	70	306	142
All Time Periods	77	295	144

Table 4. Catch and harvest estimates in number of the sport fishery in the Long Point tip area of Lake Erie, July 1 - August 8, 1987.

Species	Catch (number)	Harvest (number)	Total Catch (%)	Total Harvest (%)
Coho salmon	601	601	43	87
Chinook salmon	17	17	1	3
Rainbow trout	31	31	2	4
Lake trout	4	4	<1	<1
Rock bass	30	0	2	0
Smallmouth bass	6	6	<1	1
Walleye	33	33	2	5
Freshwater drum	673	0	48	0
Total	1,395	692	100	100

Table 5. Percentage of anglers seeking particular species in the Long Point tip area of Lake Erie, July 1 - August 8, 1987.

Species	Percentage Seeking (%)
Coho salmon	93
Chinook salmon	2
Rainbow trout	4
Lake trout	<1
Walleye	1
All	100

[a] Angler preference was expressed as a percentage of species anglers over all anglers. In some cases, anglers sought more than one species, while in others no preference was stated.

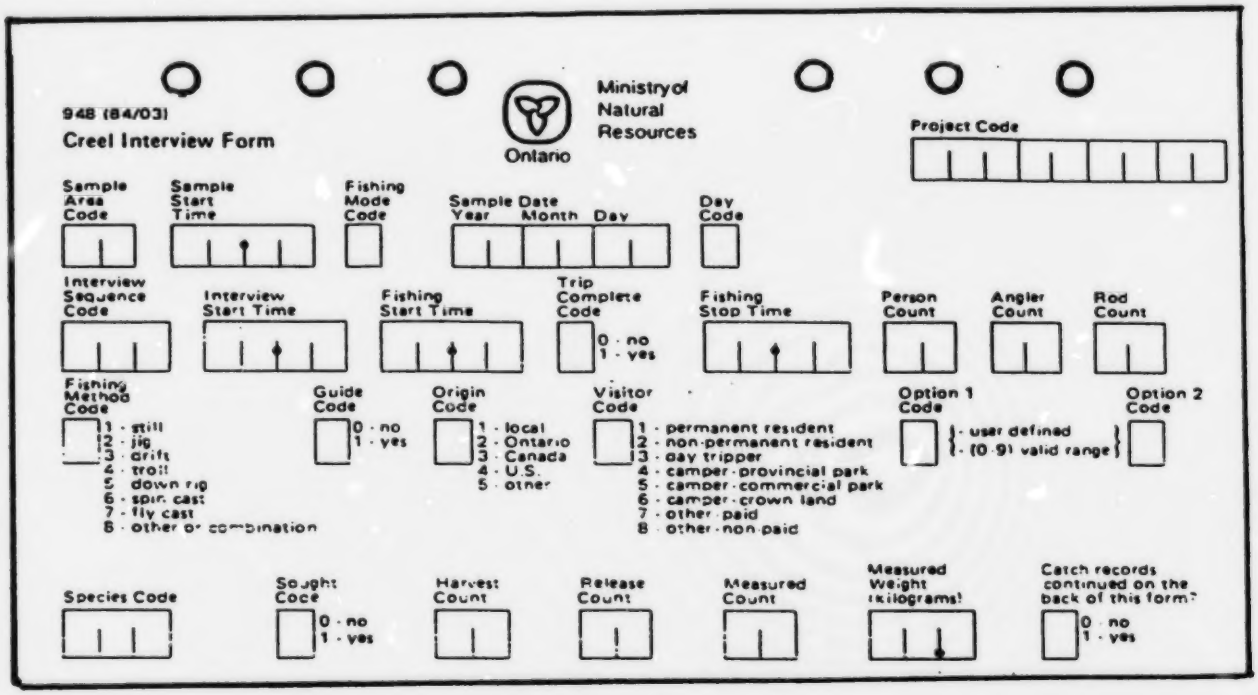
Table 6. Catch per rod-hour for selected species taken by anglers seeking specific species and by all anglers in the Long Point tip area of Lake Erie, July 1 - August 8, 1987.

	Species Specific anglers (no. caught/rod-h)	All Anglers (no. caught/rod-h)
Coho salmon	0.061	0.059
Chinook salmon	0.149	0.002
Rainbow trout	0.065	0.003
Lake trout	0.110	0.000
Walleye	0.045	0.003
Freshwater drum	-----	0.055

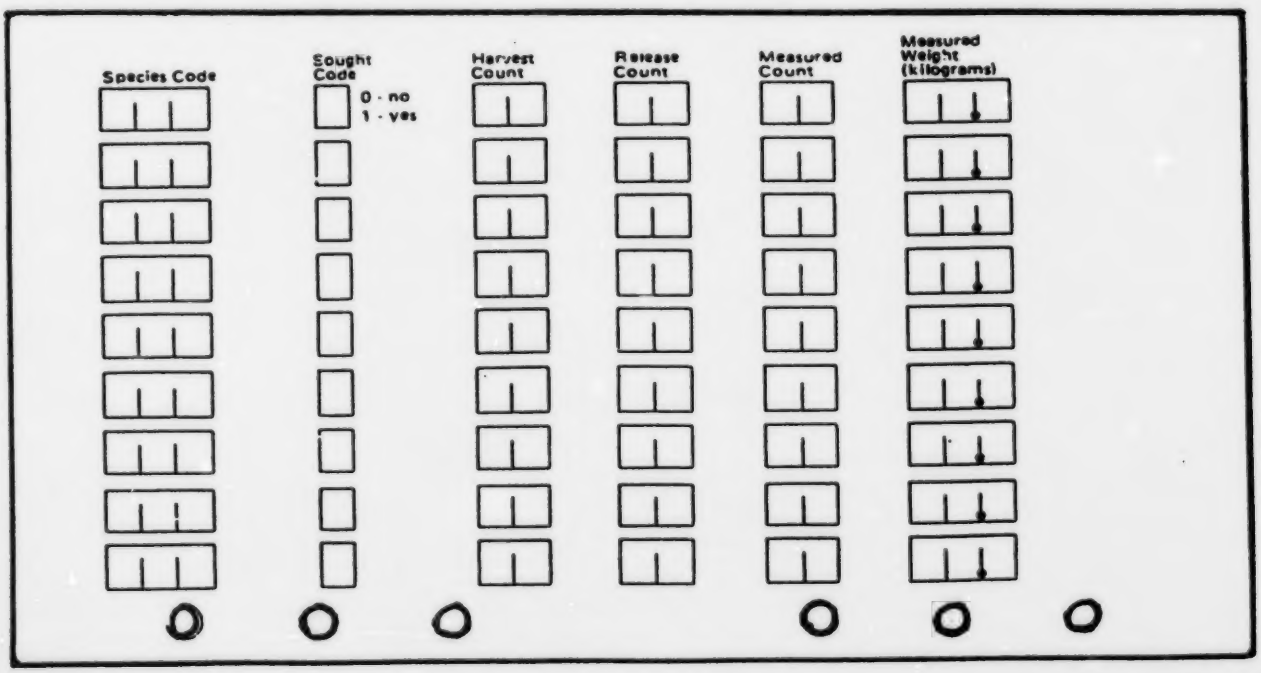
[a] Catch per rod-hour was derived by dividing the observed number of fish caught by the observed effort.

Appendix A: Field Forms

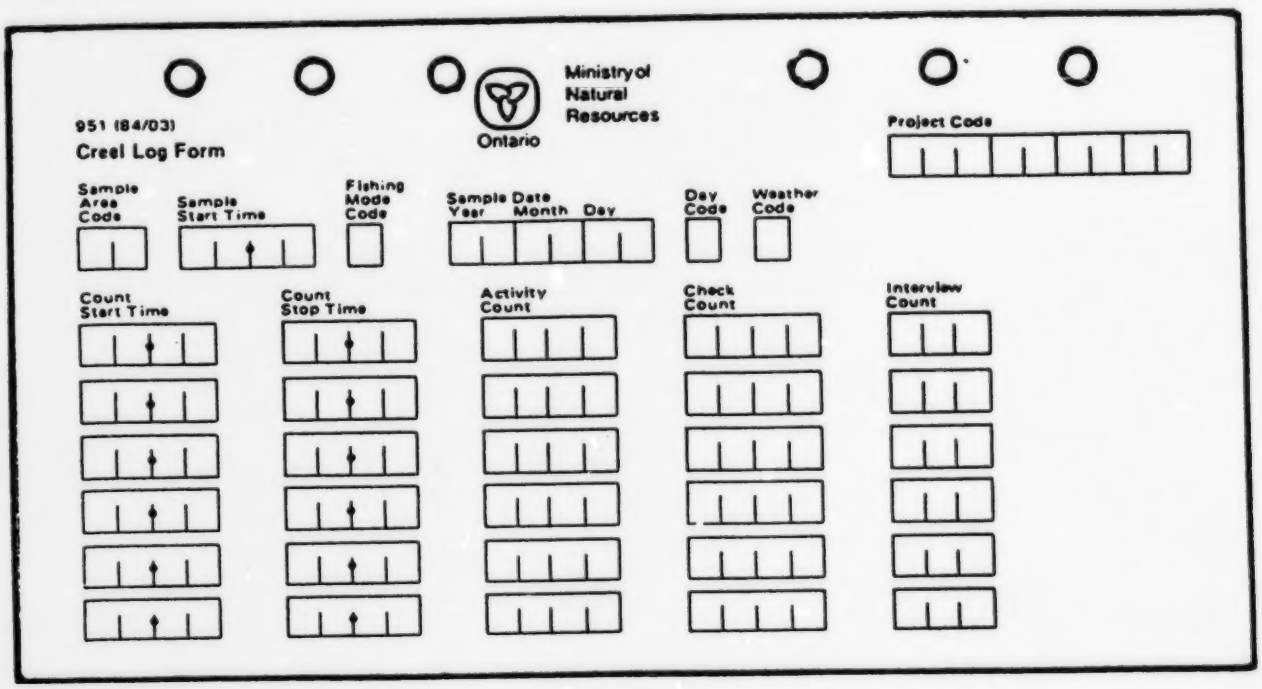
1. Creel Interview Form (Front)



Creel Interview Form (Back)



2. Creel Log Form (Front)



Creel Log Form (Back)

Codes

Day
(1) Sunday
(2) Monday
(3) Tuesday
(4) Wednesday
(5) Thursday
(6) Friday
(7) Saturday

Weather
(0) no obvious adverse effect on fishing activity
(1) possible adverse effect on fishing activity
(2) adverse effect on fishing activity

Observer Name _____

Appendix B: Computational methods (Petzold 1980).

The total estimated harvest (caught minus released) of a species in a stratum (T_h) was calculated as follows:

$$T_h = \frac{D_h}{d_h} \sum_{i}^{d_h} \hat{r}_{hi} \; N_{hi} \; \hat{\bar{x}}_{hi} \; \hat{\bar{y}}_{hi}$$

where

D_h = the number of days in stratum h

d_h = the number of days sampled in stratum h

$\hat{r}_{hi}$ = the sample catch per unit of effort on the i'th day for all anglers interviewed

$\hat{\bar{x}}_{hi}$ = the sample mean number of boats per instantaneous boat count on the i'th day

$\hat{\bar{y}}_{hi}$ = the sample mean number of rods per boat on the i'th day

$\hat{\bar{z}}_{hi}$ = the sample mean number of anglers per boat on the i'th day

N_{hi} = the number of fishing hours in the sampling period

The sample catch per unit of effort ($\hat{r}_{hi}$), the sample mean number of boats per boat count ($\hat{\bar{x}}_{hi}$) and the sample mean number of rods per boat ($\hat{\bar{y}}_{hi}$) were calculated as follows:

$$\hat{r}_{hi} = \frac{\sum_{j}^{n_{hi}} c_{hij}}{\sum_{j}^{n_{hi}} e_{hij}}$$

$$\hat{\bar{x}}_{hi} = \frac{\sum_{j}^{m_{hi}} x_{hij}}{m_{hi}}$$

$$\hat{\bar{y}}_{hi} = \frac{\sum_{j}^{n_{hi}} y_{hij}}{n_{hi}}$$

where

c_{hij} = the number of fish kept by the j'th sampled party on the i'th day

e_{hij} = the number of rod-hours fished by the j'th sampled party on the i'th day

n_{hi} = the number of parties interviewed on the i'th day

x_{hij} = the number of boats counted on the j'th boat count

m_{hi} = the number of boat counts on the i'th day

y_{hij} = the number of rods in the j'th party

The estimated total catch of a species, Tc (i.e., those kept plus those released) was estimated in the same manner as for harvest except $\hat{\bar{r}}_{hi}$ was calculated using all fish caught.

The total rod-hours in a stratum (E_h) and angler-hours (A_h) in a stratum (h) were calculated as:

$$E_h = \frac{D_h}{d_h} \sum_{i}^{d_h} N_{hi} \; \hat{\bar{x}}_{hi} \; \hat{\bar{y}}_{hi}$$

$$A_h = \frac{D_h}{d_h} \sum_{i}^{d_h} N_{hi} \; \hat{\bar{x}}_{hi} \; \hat{\bar{z}}_{hi}$$

Appendix C: Computer summaries of effort, catch per unit of effort, catch and harvest.

Explanatory Notes:

1. Computer codes denoting season are 7 for July 1 to August 8, 1987.
2. Computer codes denoting day-type are 1 for weekday and 2 for weekend days.
3. Computer codes denoting period are 1 for AM (0800-1300) and 2 for PM (1300-1800 h).
4. Multiple numerical codes indicate pooling of strata.
5. SE denotes standard error of estimate.

CREESYS 3.3 REPORT ON CREEL DEFINITION - 88/02/04 LEA-CR-87-1G...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

PAGE 1

Survey Identification:

PROJECT-NAME LONG POINT TIP CREEL SURVEY
PROJECT-LEADER LES SZTRAMKO
MNR-UNIT-NAME LAKE ERIE FISH ASSESSMENT UNIT
MNR-UNIT-LOCATION WHEATLEY ONTARIO

Waterbodies Identification:

LOCAL-NAME LONG POINT
LOCAL-NAME2 LONG POINT TIP
LOCAL-NAME3 OUTER BAY
LOCAL-NAME4
LOCAL-NAME5

Survey Definition:

SURVEY-START-DATE 87/07/01
SURVEY-END-DATE 87/08/08
FISHING-TYPE-CODE 1 ...open-water (summer)
CONTACT-METHOD-CODE 2 ...roving

STRATUM-TIME-COUNT 4
TIME-SAMPLE-FLAG 1
STRATUM-SPACE-COUNT 1
SPACE-SAMPLE-FLAG 0
STRATUM-MODE-COUNT 1
STRATUM-COUNT 4

CIF-OPTIONS-FLAG 0
CIF-MEASURE-FLAG 0
SPECIES-CODES 071 073 075 076 078 334 081 371 311 316

88/02/04
REPORT ON CREEL DEFINITION: LEA-CR-87-1G...1

Temporal Strata: LEA-CR-87-1G...1

SEASON CODE	DAYTYPE CODE	....PERIODS.... CODE	START	END	WEIGHT FLAG	PERIOD DURATN	STRATUM SIZE
7	1	1	08-00	13-00	0	5.00	27
		2	13-00	18-00	0	5.00	27
7	2	1	08-00	13-00	0	5.00	12
		2	13-00	18-00	0	5.00	12

Spatial Strata: LEA-CR-87-1G...1

.....STRATUM..... SPACE CODE	SPACE NAME	SPACE SIZE	SAMPLE AREA COUNT	...SAMPLE-AREA-CODES..... ...(ACTIVITY-EXPECTNS)....	WEIGHT FLAG
01	LONGPOINT		1	01	0

Mode Strata: LEA-CR-87-1G...1

FISHING MODE CODE	FISHING MODE NAME	ACTIVITY UNIT CODE	INTERVIEW UNIT CODE	CHECK COUNT FLAG
1	BOAT	2	2	0

Calender file - TB$DATE: LEA-CR-87-1G...1

	SAMPLE DATE	DAY CODE	SEASON CODE	DAYTYPE CODE	STRATUM SIZE
00001	87/07/01	4	7	1	27
00002	87/07/02	5	7	1	27
00003	87/07/03	6	7	1	27
00004	87/07/04	7	7	2	12
00005	87/07/05	1	7	2	12
00006	87/07/06	2	7	1	27
00007	87/07/07	3	7	1	27
00008	87/07/08	4	7	1	27
00009	87/07/09	5	7	1	27
00010	87/07/10	6	7	1	27
00011	87/07/11	7	7	2	12
00012	87/07/12	1	7	2	12
00013	87/07/13	2	7	1	27
00014	87/07/14	3	7	1	27
00015	87/07/15	4	7	1	27
00016	87/07/16	5	7	1	27
00017	87/07/17	6	7	1	27
00018	87/07/18	7	7	2	12
00019	87/07/19	1	7	2	12
00020	87/07/20	2	7	1	27
00021	87/07/21	3	7	1	27
00022	87/07/22	4	7	1	27
00023	87/07/23	5	7	1	27
00024	87/07/24	6	7	1	27
00025	87/07/25	7	7	2	12
00026	87/07/26	1	7	2	12
00027	87/07/27	2	7	1	27
00028	87/07/28	3	7	1	27
00029	87/07/29	4	7	1	27
00030	87/07/30	5	7	1	27
00031	87/07/31	6	7	1	27
00032	87/08/01	7	7	2	12
00033	87/08/02	1	7	2	12
00034	87/08/03	2	7	2	12
00035	87/08/04	3	7	1	27
00036	87/08/05	4	7	1	27
00037	87/08/06	5	7	1	27
00038	87/08/07	6	7	1	27
00039	87/08/08	7	7	2	12

Status of DATA/DEF: LEA-CR-87-1G...1

FORM#	FORM-NAME	# OF RECORDS	STATUS
1	Creel Definition (CDF)	1	♦
2	Seasons (SDF1A)	1	♦
3	Daytypes (SDF1B)	2	♦
4	Exception Dates (SDF1C)	1	♦
5	Periods (SDF1D)	2	♦
6	Spaces (SDF2)	1	♦
7	Modes (SDF3)	1	♦

CREESYS 3.3 REPORT ON STRATA - 88/02/04 LEA-CR-87-1G...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

ALL STRATA

EFFORT-ACTIVITY Totals:

.STRATUM. CODE	SAMPLE SIZE	SAMPLE COUNT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	ESTIMATED ...EFFORT.... AG-HR	ESTIMATED ...EFFORT.... SE	ESTIMATED ...EFFORT.. . RD-HR	ESTIMATED ...EFFORT.. . SE	NO. OF CTS	ATY UNIT	MEAN ATY /CT	MEAN SAMPLE ATY:CT	NO. OF ITVS	MEAN AGLRS /ITV	MEAN RODS /ITV
711011	27	5	285.5	291.1	2215	797	2319	848	8	2	7.3	5.9	50	2.78	2.90
712011	27	4	415.2	418.9	1863	1234	1880	1249	6	2	7.8	5.9	46	2.35	2.37
721011	12	4	786.8	809.6	3272	1128	3407	1189	7	2	23.4	20.5	129	2.68	2.79
722011	12	1	599.0	599.0	3669	0	3669	0	2	2	23.0	23.0	44	2.66	2.66

ANGLERS1 Totals:

STRAT CODE	FISHING METHOD 1	2	3	4	5	6	7	8	NL:	GUIDE 0	1	NL:	ORIGIN 1	2	3	4	5	NL:	VISITOR-TYPE 1	2	3	4	5	6	7	8	NL:
711011	0	0	0	0	139	0	0	0	0	139	0	0	76	63	0	0	0	0	0	0	139	0	0	0	0	0	0
712011	2	0	0	0	106	0	0	0	0	108	0	0	79	29	0	0	0	0	0	0	108	0	0	0	0	0	0
721011	0	0	0	0	346	0	0	0	0	344	2	0	198	142	0	6	0	0	0	0	346	0	0	0	0	0	0
722011	2	0	0	0	115	0	0	0	0	117	0	0	66	51	0	0	0	0	0	0	117	0	0	0	0	0	0

CATCH (ALL ANGLERS) Totals:

STRAT CODE	SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	OBSERVED ...EFFORT... RD-HR	OBSERVED .....CUE..... /AG-HR	OBSERVED .....CUE..... /RD-HR	ESTIMATED ....CATCH.... CT	ESTIMATED ....CATCH.... SE	ESTIMATED ....HRVST.... CT	ESTIMATED ....HRVST.... SE	ESTIMATED ....EFFORT... AG-HR	ESTIMATED ....EFFORT... RD-HR	ESTIMATED .....CUE..... /AG-HR	ESTIMATED .....CUE..... /RD-HR
711011	073	139	10	10	286	291	0.035	0.034	63	51	63	51	2215	2319	0.028	0.027
711011	334	139	0	0	286	291	0.000	0.000	0	0	0	0	2215	2319	0.000	0.000
711011	371	139	39	0	286	291	0.137	0.134	247	145	0	0	2215	2319	0.111	0.106
712011	073	108	31	31	415	419	0.075	0.074	138	122	138	122	1863	1880	0.074	0.073
712011	076	108	1	1	415	419	0.002	0.002	4	4	4	4	1863	1880	0.002	0.002
712011	081	108	1	1	415	419	0.002	0.002	4	4	4	4	1863	1880	0.002	0.002
712011	371	108	9	0	415	419	0.022	0.021	42	33	0	0	1863	1880	0.022	0.022
721011	073	346	65	65	787	810	0.083	0.080	278	131	278	131	3272	3407	0.085	0.082
721011	075	346	4	4	787	810	0.005	0.005	17	10	17	10	3272	3407	0.005	0.005
721011	076	346	5	5	787	810	0.006	0.006	20	10	20	10	3272	3407	0.006	0.006
721011	311	346	4	0	787	810	0.005	0.005	17	10	0	0	3272	3407	0.005	0.005
721011	334	346	2	2	787	810	0.003	0.002	8	4	8	4	3272	3407	0.003	0.002
721011	371	346	18	0	787	810	0.023	0.022	73	30	0	0	3272	3407	0.022	0.021
722011	073	117	20	20	599	599	0.033	0.033	123	0	123	0	3669	3669	0.033	0.033
722011	076	117	1	1	599	599	0.002	0.002	6	0	6	0	3669	3669	0.002	0.002
722011	311	117	2	0	599	599	0.003	0.003	12	0	0	0	3669	3669	0.003	0.003
722011	316	117	1	1	599	599	0.002	0.002	6	0	6	0	3669	3669	0.002	0.002
722011	334	117	4	4	599	599	0.007	0.007	24	0	24	0	3669	3669	0.007	0.007
722011	371	117	51	0	599	599	0.085	0.085	312	0	0	0	3669	3669	0.085	0.085

CATCH (SPECIES ANGLERS) Totals:

			OBSERVED						ESTIMATED							
STRAT CODE	SPEC CODE	AGLR CT	CATCH CT	HRVST CT	...EFFORT... AG-HR	RD-HR	.....CUE..... /AG-HR	/RD-HR	...CATCH.... CT	SE	...HRVST.... CT	SE	...EFFORT... RD-HR	SE	.....CUE..... /AG-HR	/RD-HR
711011	073	139	10	10	286	291	0.035	0.034	63	51	63	51	2319	848	0.028	0.027
711011	334	2	0	0	7	7	0.000	0.000	0	0	0	0	36	33	0.000	0.000
712011	073	108	31	31	415	419	0.075	0.074	138	122	138	122	1880	1249	0.074	0.073
712011	076	2	1	1	8	8	0.119	0.119	4	4	4	4	37	34	0.118	0.118
712011	081	2	1	1	9	9	0.110	0.110	4	4	4	4	40	37	0.109	0.109
721011	073	324	64	64	713	736	0.090	0.087	274	128	274	128	3100	1050	0.092	0.088
721011	075	12	4	4	27	27	0.149	0.149	17	10	17	10	115	61	0.150	0.148
721011	076	25	5	5	90	90	0.055	0.055	20	10	20	10	372	243	0.055	0.054
721011	334	6	1	1	14	14	0.072	0.072	4	3	4	3	56	28	0.068	0.068
722011	073	107	18	18	556	556	0.032	0.032	110	0	110	0	3405	0	0.032	0.032
722011	076	2	1	1	10	10	0.105	0.105	6	0	6	0	58	0	0.105	0.105
722011	334	2	0	0	2	2	0.000	0.000	0	0	0	0	13	0	0.000	0.000

CREESYS 3.3 REPORT ON COMBINED STRATA - 88/02/04 LEA-CR-87-16...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

SEASONS: 7
DAYTYPES: 1 2
PERIODS: 1 2
SPACES: 01
MODES: 1

PAGE 1

EFFORT-ACTIVITY Totals:

SAMPLE COUNT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	ESTIMATED ...EFFORT.... AG-HR	SE	...EFFORT.... RD-HR	SE	NO. OF CTS	ATY UNIT	MEAN ATY /CT	MEAN SAMPLE ATY:CT	NO. OF ITVS	MEAN AGLRS /ITV	MEAN RODS /ITV
14	2086	2118	11019	1852	11275	1921	23	2	13.7	11.3	269	2.64	2.72

ANGLERS1 Totals:

	0	1	2	3	4	5	6	7	8	9	NUL
FISHING-METHOD.	-	4	0	0	0	706	0	0	0	-	0
GUIDE	708	2	-	-	-	-	-	-	-	-	0
VISITOR-TYPE	-	0	0	710	0	0	0	0	0	-	0
ORIGIN	-	419	285	0	6	0	-	-	-	-	0

CATCH (ALL ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	OBSERVED RD-HR	OBSERVED .....CUE..... /AG-HR	/RD-HR	ESTIMATED ...CATCH..... CT	SE	...HRVST..... CT	SE	....EFFORT... AG-HR	RD-HR	.....CUE..... /AG-HR	/RD-HR
073	710	126	126	2086	2118	0.060	0.059	601	186	601	186	11019	11275	0.055	0.053
075	710	4	4	2086	2118	0.002	0.002	17	10	17	10	11019	11275	0.002	0.002
076	710	7	7	2086	2118	0.003	0.003	31	11	31	11	11019	11275	0.003	0.003
081	710	1	1	2086	2118	0.000	0.000	4	4	4	4	11019	11275	0.000	0.000
311	710	6	0	2086	2118	0.003	0.003	30	10	0	0	11019	11275	0.003	0.003
316	710	1	1	2086	2118	0.000	0.000	6	0	6	0	11019	11275	0.001	0.001
334	710	6	6	2086	2118	0.003	0.003	33	4	33	4	11019	11275	0.003	0.003
371	710	117	0	2086	2118	0.056	0.055	673	151	0	0	11019	11275	0.061	0.060

CATCH (SPECIES ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	OBSERVED RD-HR	OBSERVED .....CUE..... /AG-HR	/RD-HR	ESTIMATED ...CATCH.... CT	SE	...HRVST.... CT	SE	...EFFORT... RD-HR	SE	.....CUE..... /AG-HR	/RD-HR
073	678	123	123	1969	2001	0.062	0.061	585	184	585	184	10704	1838	0.056	0.055
075	12	4	4	27	27	0.149	0.149	17	10	17	10	115	61	0.150	0.148
076	29	7	7	108	108	0.065	0.065	31	11	31	11	467	246	0.066	0.065
081	2	1	1	9	9	0.110	0.110	4	4	4	4	40	37	0.109	0.109
334	10	1	1	22	22	0.045	0.045	4	3	4	3	104	43	0.036	0.036

CREESYS 3.3 REPORT ON COMBINED STRATA - 88/02/04 LEA-CR-87-16...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

SEASONS: 7
DAYTYPES: 1
PERIODS: 1 2
SPACES: 01
MODES: 1

PAGE 1

EFFORT-ACTIVITY Totals:

SAMPLE COUNT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	ESTIMATED ...EFFORT.... AG-HR	SE	...EFFORT.... RD-HR	SE	NO. OF CTS	ATY UNIT	MEAN ATY /CT	MEAN SAMPLE ATY:CT	NO. OF ITVS	MEAN AGLRS /ITV	MEAN RODS /ITV
9	701	710	4078	1469	4199	1509	14	2	7.5	5.9	96	2.57	2.65

ANGLERS1 Totals:

	0	1	2	3	4	5	6	7	8	9	MUL
FISHING-METHOD.:	-	2	0	0	0	245	0	0	0	-	0
GUIDE.....:	247	0	-	-	-	-	-	-	-	-	0
VISITOR-TYPE...:	-	0	0	247	0	0	0	0	0	-	0
ORIGIN.....:	-	155	92	0	0	0	-	-	-	-	0

CATCH (ALL ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	...EFFORT... AG-HR	RD-HR	.....CUE..... /AG-HR	/RD-HR	ESTIMATED ...CATCH..... CT	SE	...HRVST..... CT	SE	....EFFORT... AG-HR	RD-HR	.....CUE..... /AG-HR	/RD-HR
073	247	41	41	701	710	0.059	0.058	201	132	201	132	4078	4199	0.049	0.048
076	247	1	1	701	710	0.001	0.001	4	4	4	4	4078	4199	0.001	0.001
081	247	1	1	701	710	0.001	0.001	4	4	4	4	4078	4199	0.001	0.001
334	247	0	0	701	710	0.000	0.000	0	0	0	0	4078	4199	0.000	0.000
371	247	48	0	701	710	0.069	0.068	288	148	0	0	4078	4199	0.071	0.069

CATCH (SPECIES ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	...EFFORT... AG-HR	RD-HR	.....CUE..... /AG-HR	/RD-HR	ESTIMATED ...CATCH.... CT	SE	...HRVST.... CT	SE	...EFFORT... RD-HR	SE	.....CUE..... /AG-HR	/RD-HR
073	247	41	41	701	710	0.059	0.058	201	132	201	132	4199	1509	0.049	0.048
076	2	1	1	8	8	0.119	0.119	4	4	4	4	37	34	0.118	0.118
081	2	1	1	9	9	0.110	0.110	4	4	4	4	40	37	0.109	0.109
334	2	0	0	7	7	0.000	0.000	0	0	0	0	36	33	0.000	0.000

CREESYS 3.3 REPORT ON COMBINED STRATA - 88/02/04 LEA-CR-87-16...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

SEASONS: 7
DAYTYPES: 2
PERIODS: 1 2
SPACES: 01
MODES: 1

PAGE 1

EFFORT-ACTIVITY Totals:

SAMPLE COUNT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	ESTIMATED EFFORT...EFFORT.... AG-HR	SE	ESTIMATED EFFORT...EFFORT.... RD-HR	SE	NO. OF CTS	ATY UNIT	MEAN ATY /CT	MEAN SAMPLE ATY:CT	NO. OF ITVS	MEAN AGLRS /ITV	MEAN RODS /ITV
5	1386	1409	6942	1128	7077	1189	9	2	23.3	21.0	173	2.68	2.76

ANGLERS1 Totals:

	0	1	2	3	4	5	6	7	8	9	NUL
FISHING-METHOD.:	-	2	0	0	0	461	0	0	0	-	0
GUIDE.....:	461	2	-	-	-	-	-	-	-	-	0
VISITOR-TYPE...:	-	0	0	463	0	0	0	0	0	-	0
ORIGIN.....:	-	264	193	0	6	0	-	-	-	-	0

CATCH (ALL ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	RD-HR	OBSERVED .....CUE..... /AG-HR	/RD-HR	ESTIMATED ...CATCH..... CT	SE	ESTIMATED ...HRVST..... CT	SE	ESTIMATED ....EFFORT... AG-HR	RD-HR	ESTIMATED .....CUE..... /AG-HR	/RD-HR
073	463	85	85	1386	1409	0.061	0.060	401	131	401	131	6942	7077	0.058	0.057
075	463	4	4	1386	1409	0.003	0.003	17	10	17	10	6942	7077	0.002	0.002
076	463	6	6	1386	1409	0.004	0.004	26	10	26	10	6942	7077	0.004	0.004
311	463	6	0	1386	1409	0.004	0.004	30	10	0	0	6942	7077	0.004	0.004
316	463	1	1	1386	1409	0.001	0.001	6	0	6	0	6942	7077	0.001	0.001
334	463	6	6	1386	1409	0.004	0.004	33	4	33	4	6942	7077	0.005	0.005
371	463	69	0	1386	1409	0.050	0.049	385	30	0	0	6942	7077	0.055	0.054

CATCH (SPECIES ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	RD-HR	OBSERVED .....CUE..... /AG-HR	/RD-HR	ESTIMATED ...CATCH.... CT	SE	ESTIMATED ...HRVST.... CT	SE	ESTIMATED ...EFFORT... RD-HR	SE	ESTIMATED .....CUE..... /AG-HR	/RD-HR
073	431	82	82	1269	1291	0.065	0.063	384	128	384	128	6505	1050	0.060	0.059
075	12	4	4	27	27	0.149	0.149	17	10	17	10	115	61	0.150	0.148
076	27	6	6	100	100	0.060	0.060	26	10	26	10	430	243	0.062	0.061
334	8	1	1	16	16	0.063	0.063	4	3	4	3	68	28	0.056	0.055

CREESYS 3.3 REPORT ON COMBINED STRATA - 88/02/04 LEA-CR-87-16...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

SEASONS: 7
DAYTYPES: 1 2
PERIODS: 1
SPACES: 01
MODES: 1

EFFORT-ACTIVITY Totals:

SAMPLE COUNT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	ESTIMATED EFFORT AG-HR	ESTIMATED EFFORT AG-HR SE	ESTIMATED EFFORT RD-HR	ESTIMATED EFFORT RD-HR SE	NO. OF CTS	ATY UNIT	MEAN ATY /CT	MEAN SAMPLE ATY:CT	NO. OF ITVS	MEAN AGLRS /ITV	MEAN RODS /ITV
9	1072	1101	5487	1381	5726	1460	15	2	14.8	12.4	179	2.71	2.82

ANGLERS1 Totals:

	0	1	2	3	4	5	6	7	8	9	NUL
FISHING-METHOD.:	-	0	0	0	0	485	0	0	0	-	0
GUIDE.....:	483	2	-	-	-	-	-	-	-	-	0
VISITOR-TYPE...:	-	0	0	485	0	0	0	0	0	-	0
ORIGIN.....:	-	274	205	0	6	0	-	-	-	-	0

CATCH (ALL ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	OBSERVED ...EFFORT... RD-HR	OBSERVED .....CUE..... /AG-HR	OBSERVED .....CUE..... /RD-HR	ESTIMATED ...CATCH..... CT	ESTIMATED ...CATCH..... SE	ESTIMATED ...HRVST..... CT	ESTIMATED ...HRVST..... SE	ESTIMATED ....EFFORT... AG-HR	ESTIMATED ....EFFORT... RD-HR	ESTIMATED .....CUE..... /AG-HR	ESTIMATED .....CUE..... /RD-HR
073	485	75	75	1072	1101	0.070	0.068	341	141	341	141	5487	5726	0.062	0.060
075	485	4	4	1072	1101	0.004	0.004	17	10	17	10	5487	5726	0.003	0.003
076	485	5	5	1072	1101	0.005	0.005	20	10	20	10	5487	5726	0.004	0.004
311	485	4	0	1072	1101	0.004	0.004	17	10	0	0	5487	5726	0.003	0.003
334	485	2	2	1072	1101	0.002	0.002	8	4	8	4	5487	5726	0.002	0.001
371	485	57	0	1072	1101	0.053	0.052	319	148	0	0	5487	5726	0.058	0.056

CATCH (SPECIES ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED ...EFFORT... AG-HR	OBSERVED ...EFFORT... RD-HR	OBSERVED .....CUE..... /AG-HR	OBSERVED .....CUE..... /RD-HR	ESTIMATED ...CATCH.... CT	ESTIMATED ...CATCH.... SE	ESTIMATED ...HRVST.... CT	ESTIMATED ...HRVST.... SE	ESTIMATED ...EFFORT... RD-HR	ESTIMATED ...EFFORT... SE	ESTIMATED .....CUE..... /AG-HR	ESTIMATED .....CUE..... /RD-HR
073	463	74	74	998	1027	0.074	0.072	337	138	337	138	5419	1349	0.065	0.062
075	12	4	4	27	27	0.149	0.149	17	10	17	10	115	61	0.150	0.148
076	25	5	5	90	90	0.055	0.055	20	10	20	10	372	243	0.055	0.054
334	8	1	1	20	20	0.049	0.049	4	3	4	3	92	43	0.041	0.041

CREESYS 3.3 REPORT ON COMBINED STRATA - 88/02/04 LEA-CR-87-16...1

LONG POINT TIP CREEL SURVEY
Roving (Equal Prob.) - 4 STRATA (87/07/01 - 87/08/08)

SEASONS: 7
DAYTYPES: 1 2
PERIODS: 2
SPACES: 01
MODES: 1

EFFORT-ACTIVITY Totals:

SAMPLE COUNT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	ESTIMATED EFFORT AG-HR	ESTIMATED EFFORT AG-HR SE	ESTIMATED EFFORT RD-HR	ESTIMATED EFFORT RD-HR SE	NO. OF CTS	ATY UNIT	MEAN ATY /CT	MEAN SAMPLE ATY:CT	NO. OF ITVS	MEAN AGLRS /ITV	MEAN RODS /ITV
5	1014	1018	5532	1234	5549	1249	8	2	11.6	9.3	90	2.50	2.51

ANGLERS1 Totals:

	0	1	2	3	4	5	6	7	8	9	NUL
FISHING-METHOD.	-	4	0	0	0	221	0	0	0	-	0
GUIDE	225	0	-	-	-	-	-	-	-	-	0
VISITOR-TYPE	-	0	0	225	0	0	0	0	0	-	0
ORIGIN	-	145	80	0	0	0	-	-	-	-	0

CATCH (ALL ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	OBSERVED CUE /AG-HR	OBSERVED CUE /RD-HR	ESTIMATED CATCH CT	ESTIMATED CATCH SE	ESTIMATED HRVST CT	ESTIMATED HRVST SE	ESTIMATED EFFORT AG-HR	ESTIMATED EFFORT RD-HR	ESTIMATED CUE /AG-HR	ESTIMATED CUE /RD-HR
073	225	51	51	1014	1018	0.050	0.050	260	122	260	122	5532	5549	0.047	0.047
076	225	2	2	1014	1018	0.002	0.002	11	4	11	4	5532	5549	0.002	0.002
081	225	1	1	1014	1018	0.001	0.001	4	4	4	4	5532	5549	0.001	0.001
311	225	2	0	1014	1018	0.002	0.002	12	0	0	0	5532	5549	0.002	0.002
316	225	1	1	1014	1018	0.001	0.001	6	0	6	0	5532	5549	0.001	0.001
334	225	4	4	1014	1018	0.004	0.004	24	0	24	0	5532	5549	0.004	0.004
371	225	60	0	1014	1018	0.059	0.059	354	33	0	0	5532	5549	0.064	0.064

CATCH (SPECIES ANGLERS) Totals:

SPEC CODE	AGLR CT	OBSERVED CATCH CT	OBSERVED HRVST CT	OBSERVED EFFORT AG-HR	OBSERVED EFFORT RD-HR	OBSERVED CUE /AG-HR	OBSERVED CUE /RD-HR	ESTIMATED CATCH CT	ESTIMATED CATCH SE	ESTIMATED HRVST CT	ESTIMATED HRVST SE	ESTIMATED EFFORT RD-HR	ESTIMATED EFFORT RD-HR SE	ESTIMATED CUE /AG-HR	ESTIMATED CUE /RD-HR
073	215	49	49	971	975	0.050	0.050	248	122	248	122	5285	1249	0.047	0.047
076	4	2	2	18	18	0.112	0.112	11	4	11	4	96	34	0.110	0.110
081	2	1	1	9	9	0.110	0.110	4	4	4	4	40	37	0.109	0.109
334	2	0	0	2	2	0.000	0.000	0	0	0	0	13	0	0.000	0.000

4110
(0.1 K P.R. 88 03 25)
ISSN 0838-1267
ISBN 0-7729-4053-9